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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/974,048	10/11/2001	Toshio Shintani	Q66510	7616

7590 07/05/2002

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EXAMINER

DINH, TUAN T

ART UNIT PAPER NUMBER

2827

DATE MAILED: 07/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/974,048

Applicant(s)

SHINTANI ET AL

Examiner

Tuan T Dinh

Art Unit

2827

*HL*

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments filed 5/28/02 have been fully considered but they are not persuasive.

**Applicant argues:**

(a) Hashimoto fails to teach a thickness of a nickel-plating layer within a range of 1.0 to 2.5 $\mu$ m.

(b) Hashimoto fails to teach a soldering bump contains tin-silver, tin-copper, or tin-silver-copper.

**Examiner disagrees.**

Response to argument (a), Hashimoto clearly shows a thickness of nickel-plating layer within a range of 1.0 to 2.5 $\mu$ m disclosed in figures 8-10 as a conventional or standard plating thickness of nickel (column 2, lines 8-14), and also, tables 3 and 4 clearly show the thickness of nickel-plating (see column 9).

Response to argument (b), Applicant's arguments with respect to claims 2-3 have been considered but are moot in view of the new ground(s) of rejection. Thus, the material made of solder now is conventional for manufacture use when assembly components soldering on board. Hashimoto in view of Goodman show a soldering bump contains tin-silver, tin-copper, or tin-silver-copper in order to improve a properties melting point of solder when uses.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States.

3. Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Hashimoto et al. (U. S. Patent 6,225,569).

As to claim 1, Hashimoto discloses a circuit board (1-figure 2, column 6, line 11) comprising:

a terminal portion (11-figure 2, column 6, lines 12-13) connected with an external terminal (32, column 6, line 26) formed in an external circuit (31, column 6, line 25), said terminal portion provided with a nickel plating layer (5, column 6, lines 16-17) and a soldering bump (33, column 6, line 27);

wherein a thickness of said nickel plating layer (5) is within a range of 1.0 to 2.5 $\mu$ m (column 2, lines 10-13, column 9, tables 3-4).

As to claim 5, Hashimoto discloses a connection structure for connecting a terminal portion (11) of a circuit board (1) with an external terminal (32) formed in an external circuit (31), wherein said terminal portion is provided with a nickel plating layer (5) and a soldering bump (33) provided on said terminal portion and a thickness of said nickel plating layer is within a range of 1.0 to 2.5 $\mu$ m (column 2, lines 10-13, see tables 3 and 4 in column 9).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (U. S. Patent 6,225,569) in view of Goodman et al. (U. S. Patent 5,477,419).

As to claims 2 and 3, Hashimoto discloses all of the limitations of the claimed invention, except for a soldering bump contains tin-silver, tin-copper, or tin-silver-copper.

Goodman teaches a soldering bump contains tin-silver, tin-copper, or tin-silver-copper (column 4, lines 24-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a soldering bump contains tin-silver, tin-copper, or tin-silver-copper as taught by Goodman to employ the solder bump of Hashimoto for a purpose which improves a melting point properties of solder attaching to a circuit board.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (U. S. Patent 6,225,569) in view of Omote et al. (U. S. Patent 6,198,052).

As to claim 4, Hashimoto discloses all of the limitations of the claimed invention, except for circuit board being a circuit provided suspension substrate.

Omote shows in figure 12 comprising circuit board being a circuit provided suspension substrate (11-figure 12, column 4, line 48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a suspension substrate provided on a circuit board as taught by Omote to modify the circuit board of Hashimoto in order to undergo of high temperature of a thermal-compression bonding of a plating layer on the circuit board.

### **Conclusion**

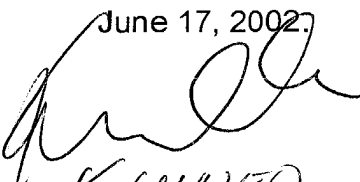
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TD

June 17, 2002.

  
K. W. WEO  
PRIMARY EXAMINER